

Eelgrass in Richardson Bay

 Audubon CALIFORNIA



Photo: A. Ardillo

Presented by: Rebecca Schwartz Lesberg, SF Bay Program Director, Audubon CA
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Overview



- About:
 - Audubon CA
 - SF Bay Program
- Why SF Bay is important for birds
- What is eelgrass?
- Eelgrass in Richardson Bay
- Eelgrass damage in RB

About Audubon CA



- Protect birds, other wildlife
- State office of Nat'l
 - Conservation, advocacy, community involvement
 - 6 centers/sanctuaries, 2 offices
- **49 chapters throughout CA**
 - Independent orgs
 - Marin Audubon Society
- **Richardson Bay Audubon Center & Sanctuary**
 - Est. 1958, 6 staff
 - 11 acres on land, 900 acres underwater
 - Home base for SF Bay Program

About SF Bay Program



- Habitat restoration
 - Subtidal and living shorelines
 - Demonstration projects
 - Aramburu Isl, Sonoma Creek
- Policy engagement
 - Waters and shorelines clean and healthy
 - Eelgrass in RB, herring fisheries plan
- Applied science
 - Watch dog for species declines, support recovery
 - Waterbird monitoring, habitat spatial analysis

Why San Francisco Bay?



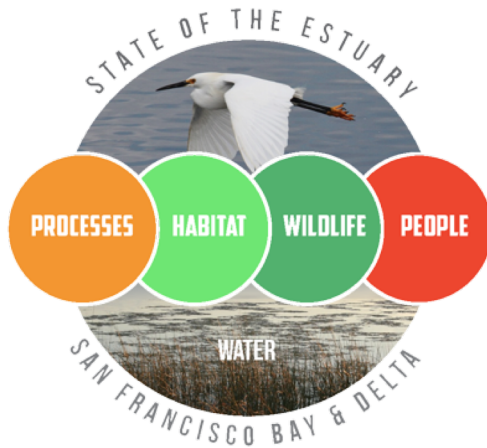
- Largest estuary on Pacific Coast
 - 10s of 1000s of birds, >500 species of wildlife
- Urban environment
 - 8 million people and growing
 - Human activity threatens the bay: habitat destruction, climate change, pollution
- Crucial resource: eelgrass

What is eelgrass?



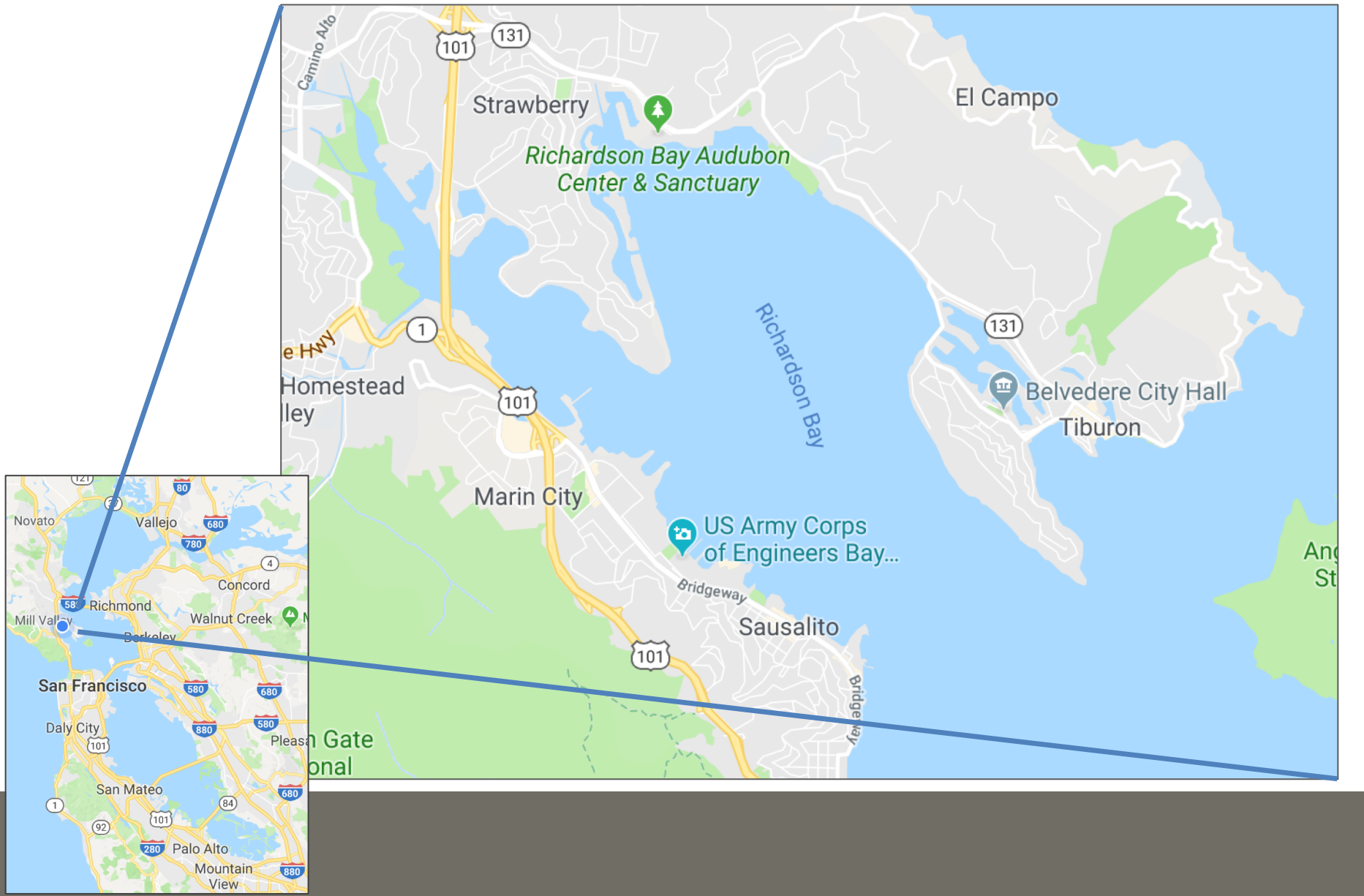
- Seagrass, flowering plant
- Shallow water bays and estuaries
- Habitat for baby fish, Dungeness crab, food for birds
- Spawning habitat for herring
 - Crucial food resource
 - Last commercial fishery in SFB
- Reduces erosion, stabilizes shoreline, sequesters carbon, reduces ocean acidification

More about Eelgrass



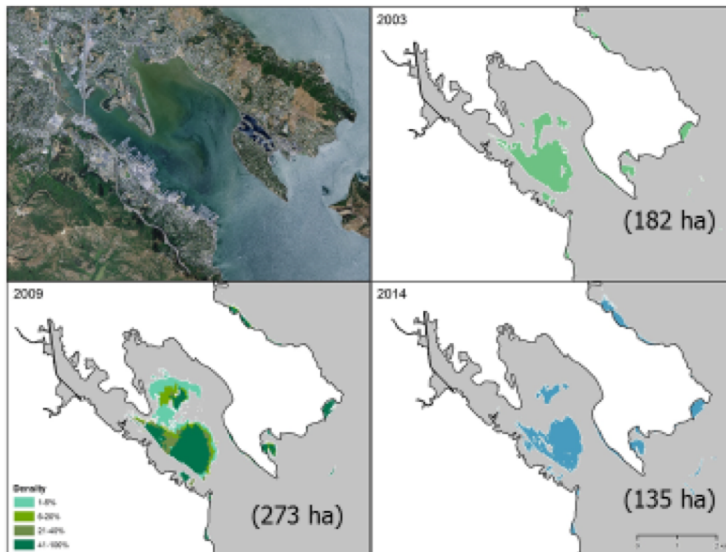
- **Worldwide decline**
 - Due to:
 - Climate change, coastal development, sediment supply
 - Anchor scour – direct threat
- Five bays in CA – 80% eelgrass
- Moderate gains in SF Bay after drastic reductions in early/mid 20th century
 - Increases have stopped or even reversed
 - Half of CA eelgrass:
 - RB has 2nd largest bed

Richardson Bay



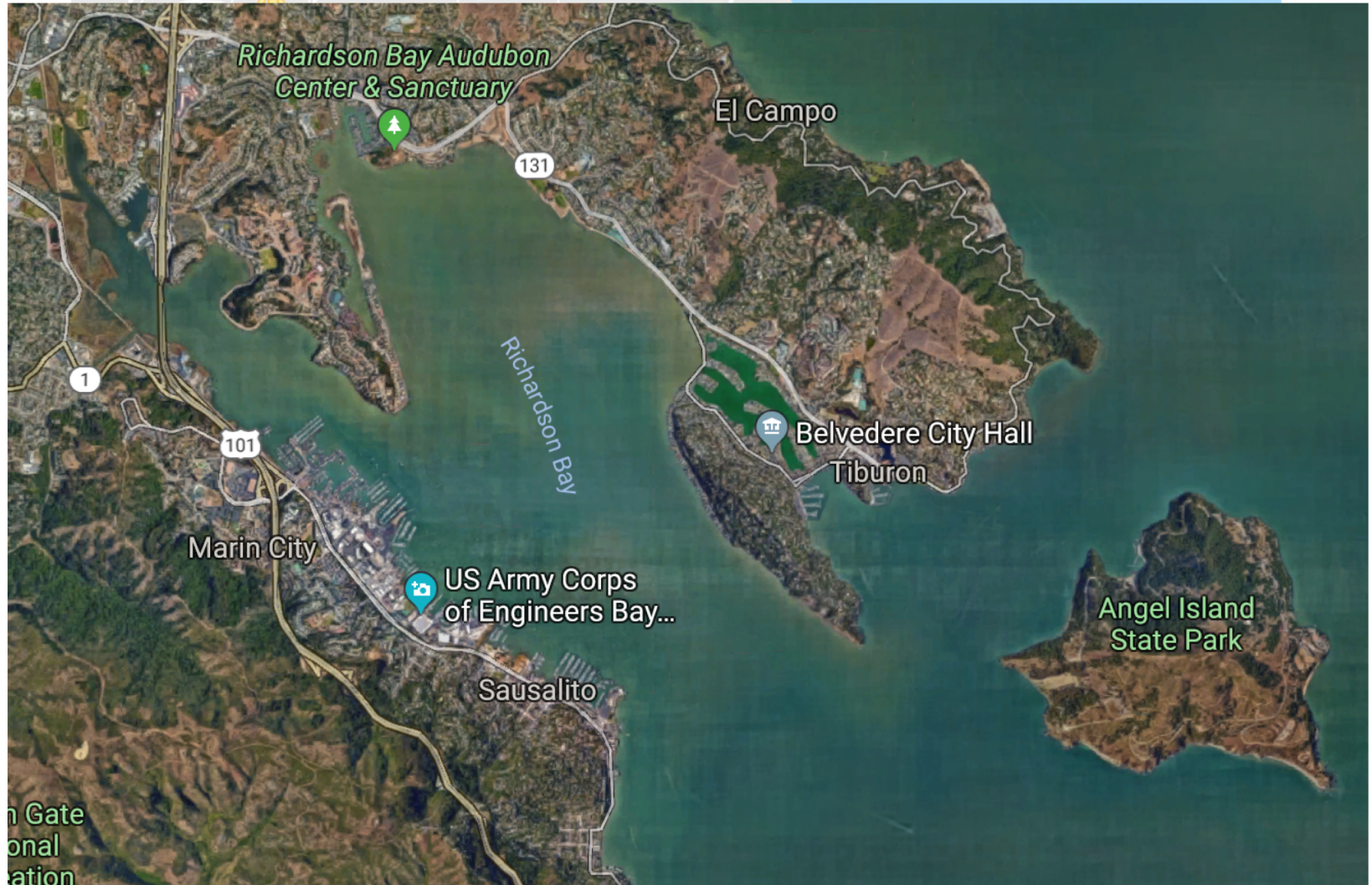
Eelgrass in Richardson Bay

**Richardson Bay Eelgrass Extent
in 2003, 2009, and 2014:**
(Merkel and Associates, 2015)



- **Coverage:**
 - 2009: 675 acres
 - 2014: 335 acres
- **Majority of eelgrass in RB: waters off Sausalito**
 - Eelgrass damage from anchors/moorings
- **Audubon:**
 - Aerial image (low tide, July 2017)
 - Spatial analysis to quantify damage

Eelgrass Damage in RB



Eelgrass Damage in RB



Eelgrass Damage in RB



Damage by the numbers

- Conservative estimates:
only “damage” if high
degree of certainty
 - True damage likely higher

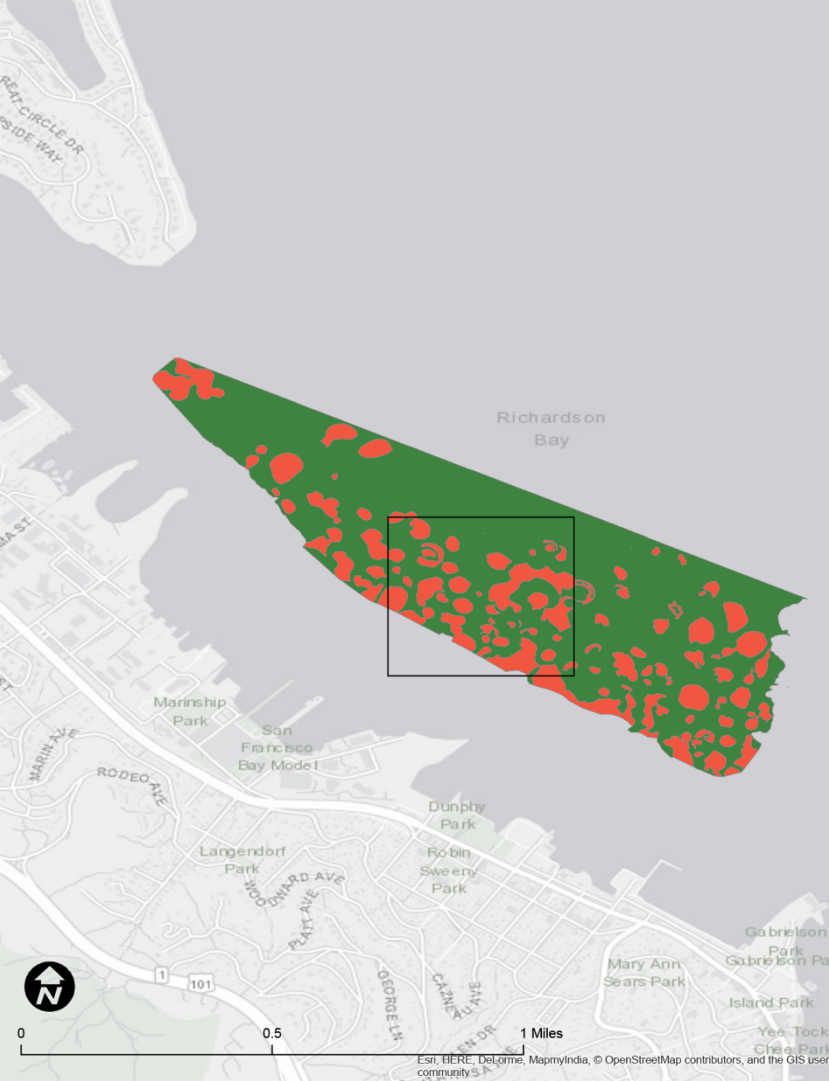
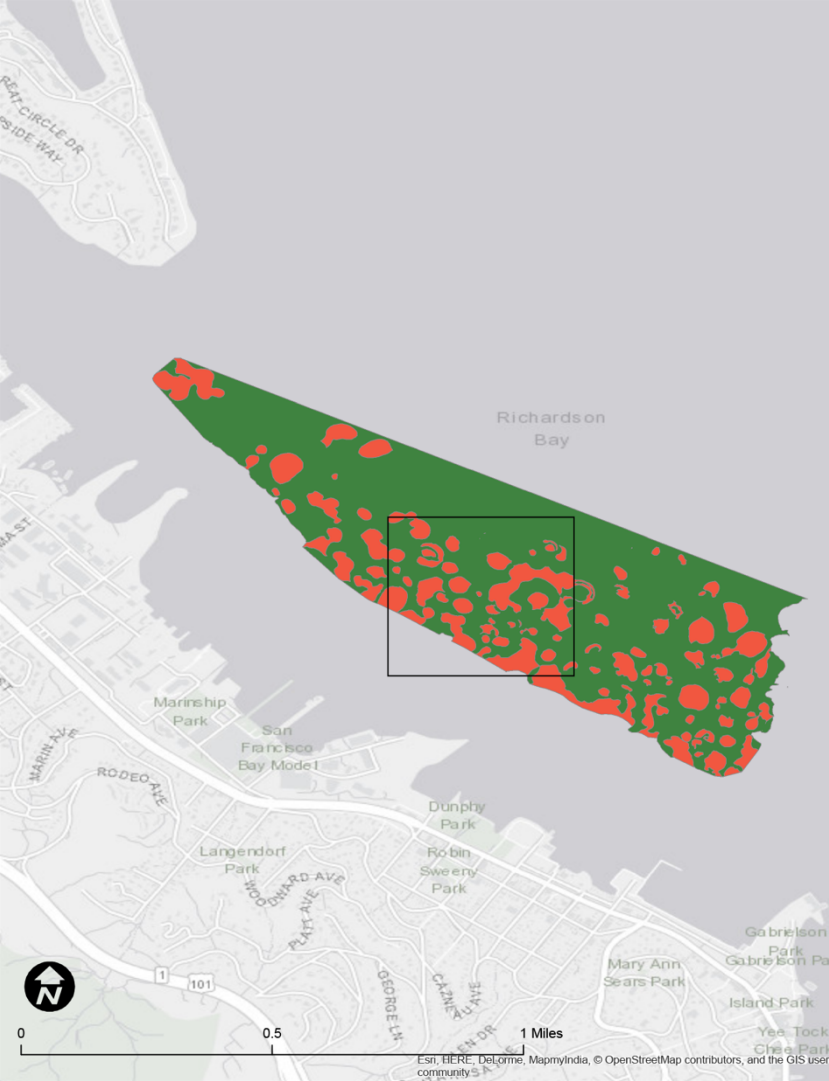


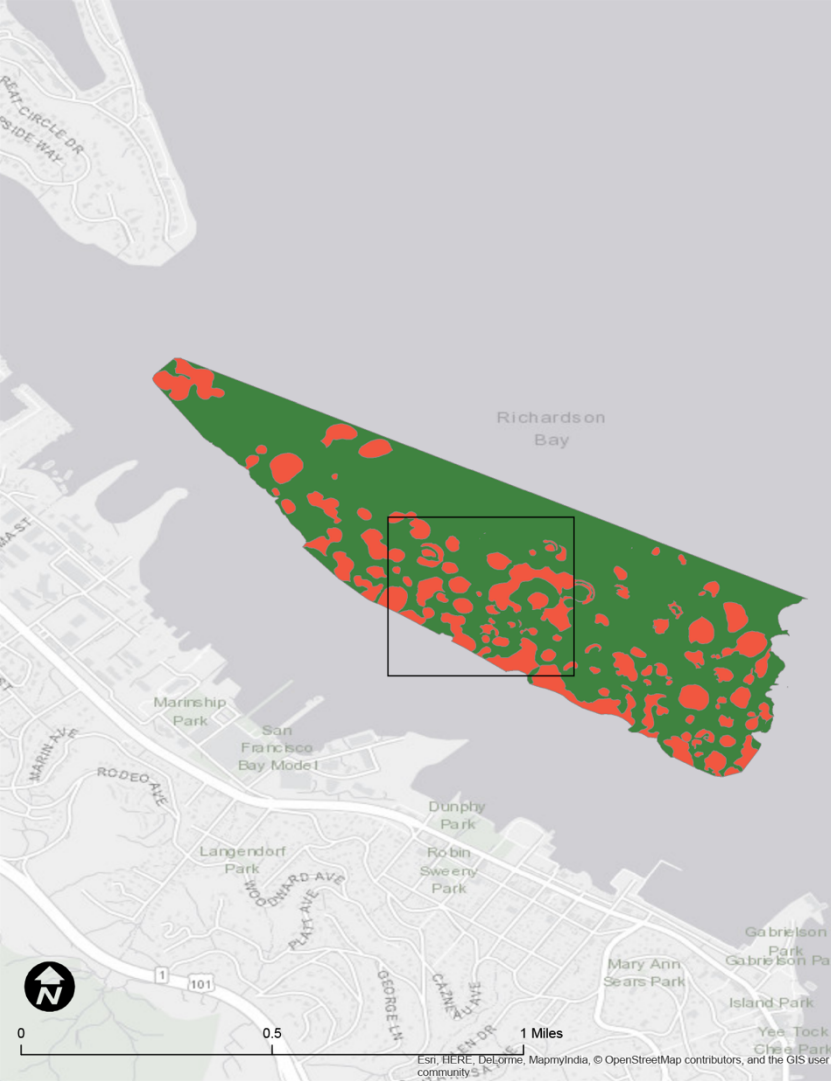
Image: GIS map of Richardson Bay waters off Sausalito. Colored area is where eelgrass overlaps with anchor-out boats. Green areas are healthy eelgrass. Red areas are damaged due to ground tackle. Black box roughly corresponds to aerial image in previous slide.

Damage by the numbers



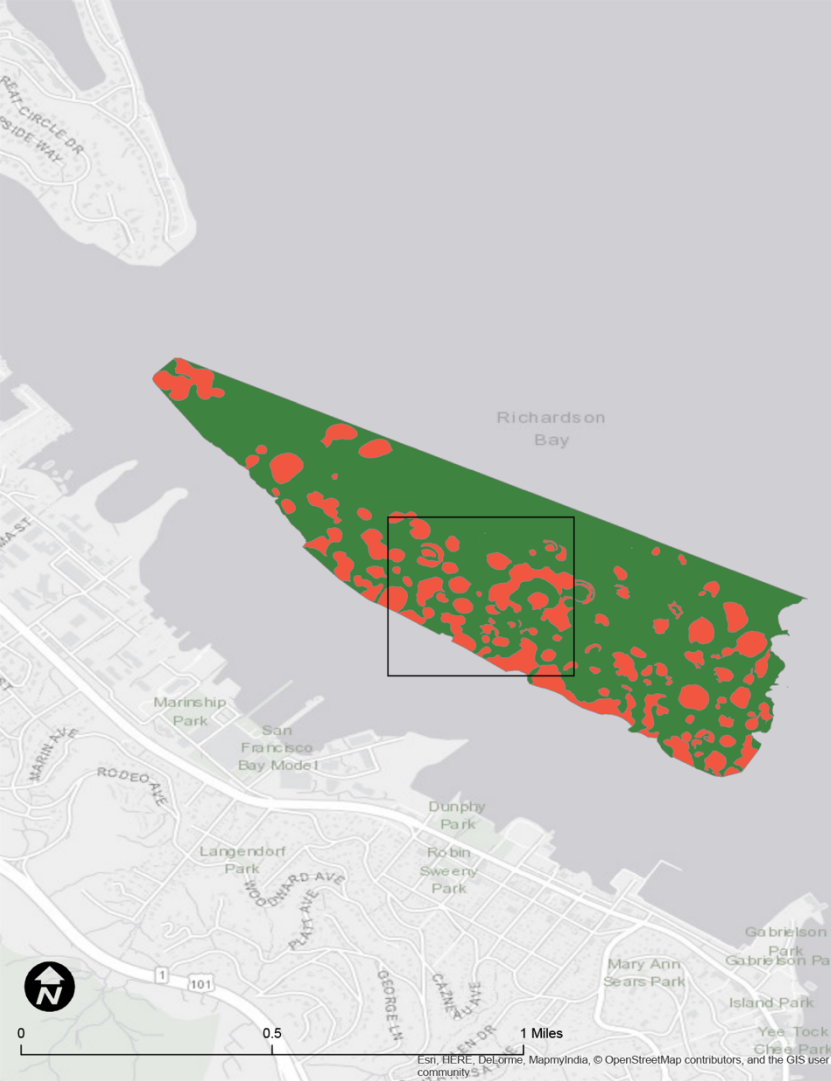
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acres (~2/3 of RB bed)
- To id

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- Total damage: 50-84 acres
 - 2x size of Alcatraz

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acres (~2/3 of RB bed)
- Total damage: 50-84 acres
 - 2x size of Alcatraz
- Average injury per vessel:
0.4 acres
 - Almost ½ the size of a football
field (excluding endzones)

How big of a deal is this?



- Consistent with studies across the world re impacts from boats/moorings on eelgrass (e.g., Florida, Australia)
- CA eelgrass mitigation policy:
 - Eelgrass is “essential fish habitat”
 - “No net loss”, mitigation ratio of at least 1.2:1
- Restoration is expensive: \$50,000-\$100k/acre
 - 50 acres damaged: \$3-6 million for 60 acres restored

Closing Thoughts

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Photo: B. Hinz